

# ATCO NEWSLETTER

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VOLUME 6 NUMBER 4

OCTOBER 1989

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## ATCO SHOW 'N TELL WRAP-UP

Twenty-six ATCO members and eight guests enjoyed the 1989 ATCO Special Event in the Hilliard Municipal Park on Sunday 24 September from one to four-thirty in the afternoon. The day was bright and sunny with the temperature in the lower sixties. In addition to the ATVers, a contingent of yellow jackets was much in evidence and difficult to ignore - hi.

Bill, W8DMR, our Special Event Chairman, planned the fun afternoon which included a "plenty-to-eat" luncheon at one-thirty followed by a brief business meeting. Warren, K8BGZQ, ATCO Newsletter Editor and Acting ATCO Treasurer, asked  
(continued on next page)



## ATCO SHOW 'N TELL WRAP-UP

(continued from page 1)

members to submit articles for the ATCO Newsletter and reported on the state of ATCO's finances. Chuck, WBBLGA, and Ken, WABRUT, were presented "Certificates of Appreciation" from ATCO. Chuck was recognized for establishing the ATCO Repeater and recognition was given to Ken for his efforts in initiating publication of the ATCO Newsletter. The afternoon's program was topped off with sixteen Show 'n Tell presentations.

Patty, N8LEP, reminds us to thank the following for contributing food for the Show 'n Tell Luncheon:

Cheryl, KN8DMK XYL, for the lovely bowl of fruit; Betty, W8EOY XYL, for the tasty macaroni and cheese dish and the broccoli salad; and Maxine, KA8GZQ XYL, delicious potato salad, apple cake, pecan topped chocolate cake, and relish tray.

And we wish to add our thanks to Patty, N8LEP and W8DMR XYL, for the very delicious warm baked beans, potato salad, taco salad, tortillas, German chocolate cake, and potato chips.

Other XYL's in an attendance were Barb (W8BJN); Marty (KA8KQQ); Cindy (N8FC); and Joan (W8CCW).

Our thanks to Dave, KB2ARL, for talking us in on 147.45 MHZ. Without his assistance some of us might have missed the event.

(continued on page 3)

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## YOU'LL WANT TO READ

ATCO Show 'n Tell Wrap-up.....Pages 1, 2, 3, and 9  
History of ATV Publications.....Page 4  
ATV News Items of Interest.....Pages 7 and 8  
Antenna Element Length Finder.....Page 10  
Financial Statement.....Page 12

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The ATCO Newsletter is the official publication of a group of television amateurs known as "AMATEUR TELEVISION IN CENTRAL OHIO" and is published in January, April, July, and October.

Membership in ATCO is open to any FCC licensed radio amateur who has an interest in amateur television.

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## ATCO SHOW 'N TELL WRAP-UP

(continued from page 2)

The following is a listing of ATCO Show 'n Tell presentations:

Dave, WBAER - Electrostatic belt generator and carbon-stick microphone.

Dick, WBRVH - 910 MHz transmitter using a PC-TXA5-33 and amplifier. 1258 MHz transmitter using a PC-TV6-12A and amplifier.

Henry, KB9FO - Mobile ATV installation with beam antenna.

Bill, WBBURI - 1270 MHz transmitter, AM/FM modulation and amplifier.

John, WABEOY - Microwave oven ATV transmitter and 23 cm antenna.

Sob, WM8P - 6AF4 UHF grid-dipper, 370-490 MHz demonstration.

Bill, WBBYIF - Matching section, 75 to 50 ohms.

Dale, WABKQQ - Cavity filters, 144 to 450 MHz.

Foss, WBEHW - 910 MHz transmitter crystal controlled.

John, W8CCW - Inexpensive 23 cm test source.

Dave, KB2ARL - Solar Powered ATV transmitter demonstration.

Ray, NBFC - Two high current power supplies.

Foss, WBEHW; Dick, WBRVH; Bill, WBBURI; and Bill, WBDMR - Modified satellite TV receiver circuit boards for use as 23 cm FM ATV receiver with enclosures.

Bill, WBDMR - 13 cm antenna mounted downconverter probe (kit) with remote tuning control box and power supply. FM sound carrier generator, 6.0 MHz for FM ATV.

(continued on page 9)



## HISTORY OF ATV PUBLICATIONS

The first national ATV booklet known as the ATV Experimenter was started in June 1962 by Mel Shadbolt, WOKYQ, and was published by Amateur Radio Publishing, Inc. (73 Magazine). Mel lived in Dakota City, Nebraska. The last issue was dated April 1965 (No. 6 of Vol. 3).

In September 1967, Don Levine, WB2UMF, and Marty Balk, WB2SZW, published a small ATV booklet which they named A5. No. 18 of Vol. 1 was the last issue. A5 is a term meaning amplitude modulation for television pictures. Among the names of subscribers listed in the first issue of A5 was Ron Cohen, but his call letters were missing. Ron is now K3ZKO. Publication ceased in July of 1970.

Publication of A5 Magazine was restarted in March of 1972 by Ron and Al Lipkin, W3AEH, and sold for 50 cents a copy. Vol. 2 No. 1 was the new beginning. Ron and Al published Vols. 2, 3, and half of Vol. 4, and publication ended in May of 1974.

Henry Ruh, KB9FO, resumed publication of A5 Magazine in January of 1975 (Henry's call at this time was WB8HEE). It was printed six times each year and sold for one dollar a copy or by yearly subscription at five dollars. By May of 1977, A5 had been around for ten years. A5 had its first color cover in July 1979.

The ATV Experimenter was published in Brooklyn, New York, by 73 Magazine. After being first published in New Jersey by Don and Marty, A5 Magazine was relocated in Philadelphia and published there by Ron and Al. Henry took it to Whitmore Lake, Michigan, and finally to Bloomington, Indiana. Henry changed A5 to an 8-1/2 by 11 inch format in January 1979.

With Vol. 11 No. 5, Henry sold A5 to Mike Stone, WBOQCD, in September of 1981, and the A5 Headquarters was moved to Lowden, Iowa. Eventually Mike renamed A5 and called it SPEC-COM. Mike published A5 each month in 1982, but this was a difficult task since almost everything doubled except the number of subscribers. More articles and more advertisers were needed. SPEC-COM was printed ten times in 1987 and is currently being published six times annually.

A new ATV magazine, Amateur Television Quarterly (ATVQ), published by Henry, KB9FO, and ATCO member Bill Brown, WB8ELK, appeared in January of this year. A year's subscription is \$15.

Mike Donovan, KAOJAW, became a full partner with Mike Stone, WBOQCD, in September of this year to continue the bimonthly publishing of SPEC-COM. Stone remains as the Editor, and Donovan has the title of Administrative Editor with related duties. A year's subscription to SPEC-COM costs \$20.

Maybe amateur television cannot sustain two national ATV magazines. If this should prove to be true, one of the publi-

(continued on page 12)

## DIFFERENT VERSIONS OF BASIC

There are some minor variations between computers depending on what version of basic is utilized. From the TRS-80, the TI-99, the VIC-20, and the C-64 to the IBM clones, some small differences exist. Every computer has a break or interrupt key. On some computers, a combination of keys is required. Always use the programmer's reference manual to determine the convention.

Two examples are as follows:

1. CLEARING THE SCREEN. Many computers use the statement CLS, others use call CLEAR, and some use a print statement followed by CLR enclosed in brackets and quotes.

2. THE INPUT COMMAND. The variation exists in punctuation. Some computers use a colon (:), some a semicolon (;), some a comma (,), and some computers print a question mark (?) after the input line. Other computers have eliminated the question mark depending on the punctuation symbol selected.

Regardless of which version your computer uses, don't panic. Whether it is Atari-basic, GW-basic, HP-basic, or Apple-basic, a statement or command exists that will perform or do the program action required. Versions of basic differ the most among graphic commands and statements. (Submitted by Bill, W8DMR.)

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## COLUMBUS FIRM GETTING INTO SATELLITE BUSINESS

Nationwide Communications says that it has made a substantial investment in a company that is planning to beam audio and visual signals via a new satellite directly to compact, inexpensive receiving dishes.

United States Satellite Broadcasting Systems Inc. is trying to raise several million dollars in start-up costs for the project. The company plans to launch its satellite in the early 1990's. Japan has a similar direct-broadcast system already in operation!

This new square receiving dish is less than 15 inches across, weighs only a few pounds, and can be installed on a roof or even atop a television set.

The satellite would provide eight channels of programming, including both advertising-based and pay-per-view services.

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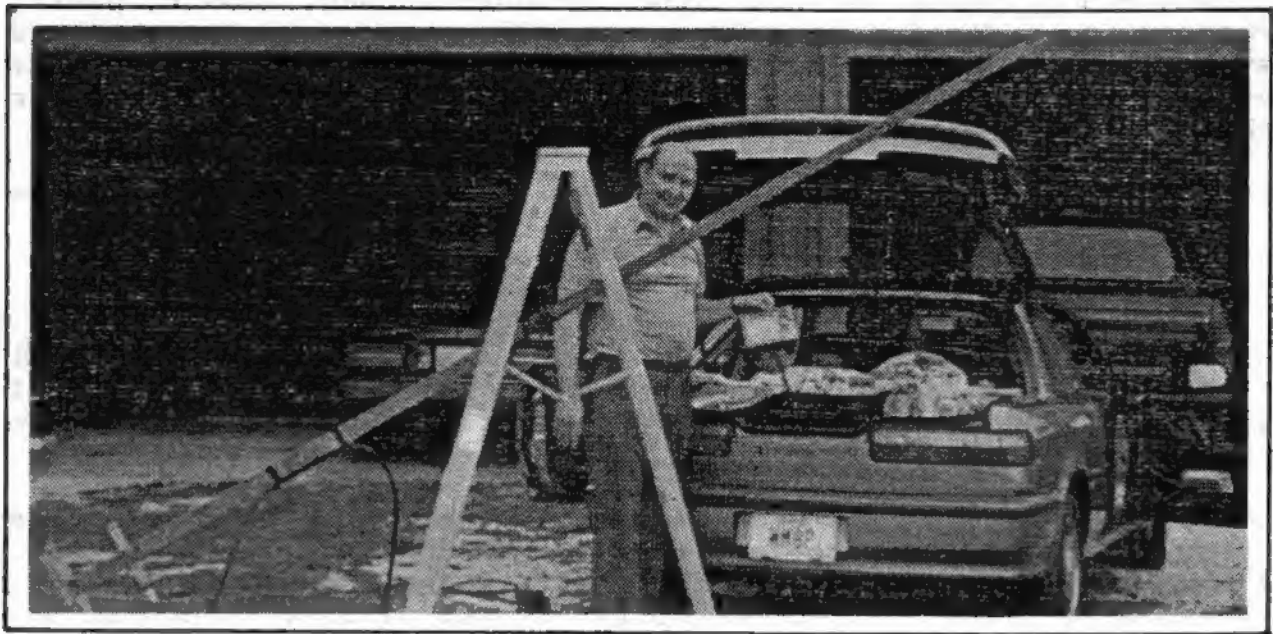
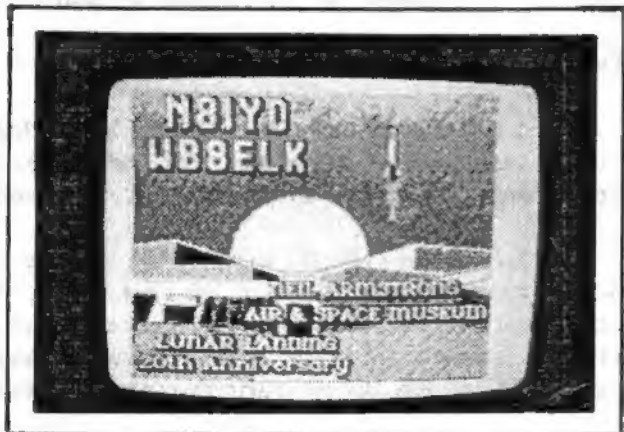
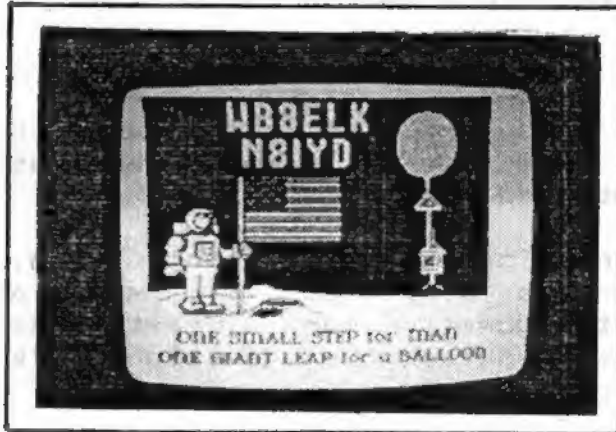
TUESDAY NIGHT ATCO NET MEETS AT 8 PM AFTER TIME CHANGE!

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## WB8ELK BALLOON LAUNCH

Bill, WB8URI, sent these photos of the 23 July 1989 WB8ELK Balloon Launch. Two of the pictures show the video screens transmitted from the balloon; the third picture is of Bob, WM8P, at Bill's QTH viewing the launch with a ground mounted Quagi and a five inch black and white TV.



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## OUR CONTRIBUTORS

Thanks to the following ATCO members for articles appearing in this issue of the ATCO Newsletter:

Bill, W8DMR; Bill, WB8URI; Ray, N8FC; and Bob, W8TV.

A special thanks to Patty, N8LEP, and OM Bill for providing Show 'n Tell details.

## ATV NEWS ITEMS OF INTEREST

By Bill, W8DMR

N8FC NOW HAS ATV RECEIVE CAPABILITY - Ray has constructed a 12 foot boom 23 element Yagi beam antenna. He has received several stations with reports of P3 to P4 and in color. Ray plans on adding an antenna rotor, a preamp, and low loss cable. His VCR and TV receiver internal UHF converters both tune to 439.25 MHz without any modifications.

WB8YIF IS ACTIVE FROM LITTLE HOCKING, OHIO - If you don't know, Little Hocking is near Belpre in southeastern Ohio. Bill is currently gathering material to build a high power amplifier for 70 cm.

NEW TV OPERATOR FOR WB8URI? - Still too early to say for certain, but XYL Jane presented Bill with a 6 lb. 4 oz. boy, Zachary William, on 29 August at about 10:14 p.m. Our congratulations to Bill and Jane.

W8RVH WORKS NORTH CAROLINA FROM NEW CARLISLE ATV STATION - While Don, K4SA0, was at an altitude of 6200 feet on Roan Mountain, Dick delivered a P3 picture. Many other Ohio ATVers worked Don on 2 meters.

### \*\*\*\*\* TECHNICAL EDITOR RESIGNS

A letter of resignation as Technical Editor of the ATCO Newsletter was received on 29 September from Bill, W8DMR. His resignation is effective 1 October 1989. Bill also writes he will no longer perform any chairman activities nor will he continue with his "ATV News Items of Interest" column.

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MARYSVILLE HAMFEST SUCCESSFUL - ATVers attending included KN8DMK, W8BRUT, W8BP, W8BURI, W8BBW, W8BI, K8BGZQ, W8BRMC, K8PYQ, K8BLWR, W8TTY (inactive), W8BJN, and W8DMR.

W8RVH DOES IT THE EASY WAY - Dick has phase locked a TVG-12A oscillator to a referenced crystal oscillator using a single IC. This represents a very easy way to construct a synthesized exciter. Nice going Dick!

W8BP ACQUIRES 23 cm EQUIPMENT - Bob now has a 23 cm loop yagi, a downconverter, and a surplus satellite receiver board. The antenna is up and with a rotator. Bob is in the process of modifying the R-5100 board for receiving FM ATV on 23 cm.

SURPRISE FOR W8DMR - XYL Pat recently gave Bill a pleasant surprise when she obtained her Technician License. Pat's call is N8LEP. Her OM still can't believe it happened.

PLEASE SEND YOUR ATV NEWS ITEMS OF INTEREST DIRECTLY TO K8BGZQ.

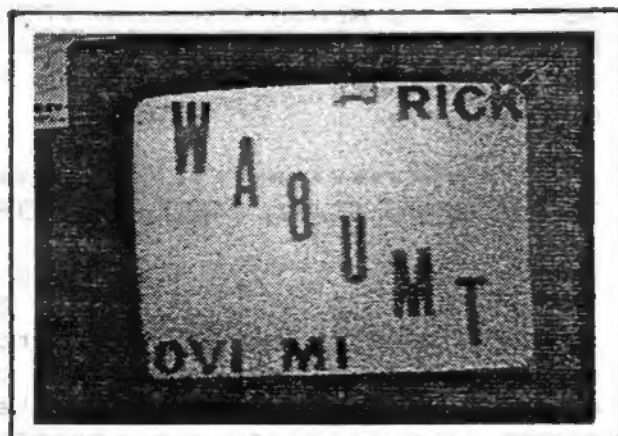
## MORE ATV NEWS ITEMS OF INTEREST

From Bill, WB8URI

ATV FIELD DAY REPORT - Tom, KA8ZNY, sent video to W8EDY, W8DMR, and W8URI from the Columbus Amateur Radio Association 1989 Field Day event. Tom and his son, Eric, were seen on the Channel 10 evening news.

AERONAUTICAL ATV - Recently, Mel, KA8LWR, piloted an airplane to 12000 feet, and Bill, WB8ELK, and his brother sent video to Michigan, Indiana, and Ohio ATVers. Among ATCO members seeing video were K8HVA, W8RVH, W8EDY, W8URI, W8DMR, W8UMT, and W8BLN.

JUNE DX OPENING - W8URI exchanged P1 reports at about 9:00 a.m. on Sunday 25 June with K9WZB located in Hebron, Indiana (near Chicago). The pictures below were taken by W8URI at about 8:30 a.m. in late June. KA8IGU is in Luckey, Ohio, and W8UMT's QTH is Novi, Michigan.



(On 5 August 1989, W8URI lost his tower and all antennas during a severe storm. - Editor.)

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## BALLOON FLIGHT SCHEDULED FOR 7 OCTOBER

Bill, WB8ELK, reports that the next balloon flight is planned for 7 October from Champaign, Illinois. Launch is expected to occur at 9:30 a.m. CDT (10:30 a.m. EDT) with a two meter beacon on 144.34 MHz, ATV on 439.25 MHz horizontal, and an HF net on 7.155 MHz with WORPK as net control. P2 or P3 signals should be seen in the Central Ohio viewing area as the balloon drifts toward Indianapolis.

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NOW'S THE TIME TO RENEW YOUR ATCO MEMBERSHIP!

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## ATCO SHOW 'N TELL WRAP-UP

(continued from page 3)

During the Show 'n Tell presentations, Chris, W68I, announced that through his efforts a 440 voice FM repeater will be moved to 445 MHz.

A great big THANKS from ATCO to those who contributed door prizes.!

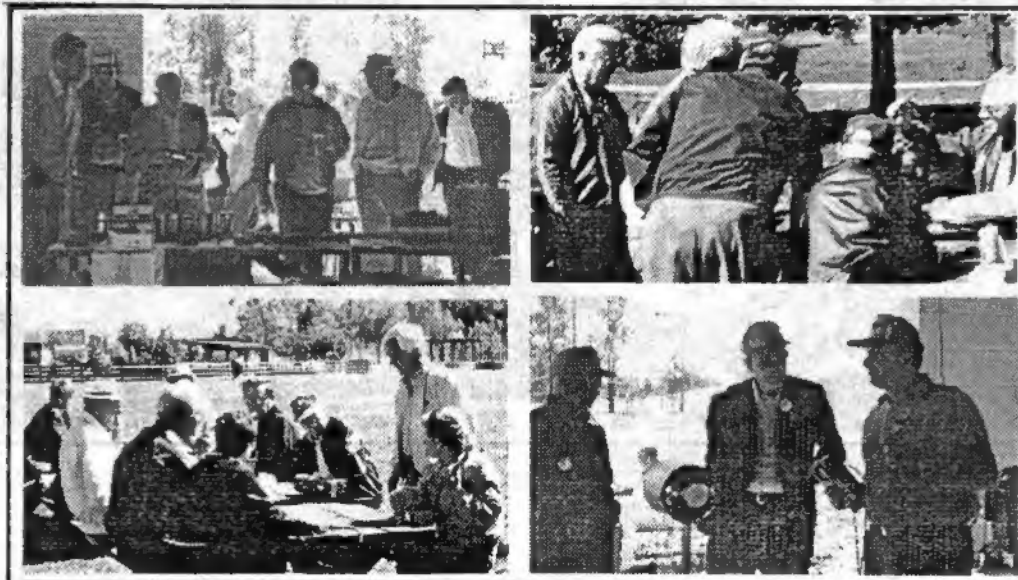
The main prize, a digital voltmeter, won by Dale, W8KQQ, and a black and white TV camera won by Bob, WMBP, were both donated by Wilbur, K8AEH.

Whitehead Radio donated two ECG transistor cross reference guides. Ray brought some excellent aluminum heat sinks, aluminum stock material, and schematic diagrams for passouts.

For the ladies, Patty, N8LEP, provided the XYL's with a memento for their attendance. Henry, KB8FO, passed out ATVQ test pattern badges and several issues of ATVQ Magazine.

Chris, W68I, was the winner of a flying spot scanner (a B&K TV analyst) donated by Ohio University and Tim, W8BCO. Bill, W8DMR, donated a high gain audio microphone amplifier which Dave, W8AER, took home.

ATCO thanks those helping to photograph the Show 'n Tell event. These include WMBP, W8BURI, W8RZG, W68I, and others. The photos printed in this issue of the ATCO Newsletter are some of the pictures taken by Bill, W8BURI. Chick will be showing his video some cold winter evening, and "Smile, you're on Candid Camera" will take on a new meaning! Chris reported he snapped more than sixty color slides; maybe he will present an "after the fact" slide show soon.



## ANTENNA ELEMENT LENGTH FINDER

Several of you responded to our request in the July issue of the ATCO Newsletter to send in your favorite ham computer programs. This time we are printing a program submitted by Ray, N8FC. Another program will be found in the January 1990 newsletter - watch for it!

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10 REM [Ant40] Antenna Element Length Finder by N8FC
20 WIDTH 40:CLS:GOSUB 370
30 INPUT;" Enter frequency in MHZ ",F:GOSUB 370
40 IF F<0 THEN 20
50 INPUT;" Enter K factor (.92-.98) ",K:IF K=0 THEN K=.96
60 IF K<.92 OR K>.98 THEN 20
70 GOSUB 370
80 PRINT:M=(492*K)/F:M=M/2:GOSUB 150
90 PRINT" 1/4 Wave ="FEET"Feet, "INCH"&"NUM"/"DEN" In."
100 M=M*2:GOSUB 150:PRINT
110 PRINT" 1/2 Wave ="FEET"Feet, "INCH"&"NUM"/"DEN" In."
120 M=M*2:GOSUB 150:PRINT
130 PRINT" 1/1 Wave ="FEET"Feet, "INCH"&"NUM"/"DEN" In."
140 K$=INKEY$:IF K$="" THEN 140 ELSE RUN
150 FEET=FIX(M):MINOR=M-FEET
160 BASE12=MINOR/(1/12)
170 INCH=FIX(BASE12):FR=BASE12-INCH
180 GOSUB 200:IF INCH=12 THEN INCH=0:FEET=FEET+1
190 RETURN
200 IF FR<.03125 THEN NUM=0:DEN=0:RETURN
210 IF FR>=.03125 AND FR<.09375 THEN NUM=1:DEN=16:RETURN
220 IF FR>=.09375 AND FR<.15625 THEN NUM=1:DEN=8:RETURN
230 IF FR>=.15625 AND FR<.21875 THEN NUM=3:DEN=16:RETURN
240 IF FR>=.21875 AND FR<.28125 THEN NUM=1:DEN=4:RETURN
250 IF FR>=.28125 AND FR<.34375 THEN NUM=5:DEN=16:RETURN
260 IF FR>=.34375 AND FR<.40625 THEN NUM=3:DEN=8:RETURN
270 IF FR>=.40625 AND FR<.46875 THEN NUM=7:DEN=16:RETURN
280 IF FR>=.46875 AND FR<.53125 THEN NUM=1:DEN=2:RETURN
290 IF FR>=.53125 AND FR<.59375 THEN NUM=9:DEN=16:RETURN
300 IF FR>=.59375 AND FR<.65625 THEN NUM=5:DEN=8:RETURN
310 IF FR>=.65625 AND FR<.71875 THEN NUM=11:DEN=16:RETURN
320 IF FR>=.71875 AND FR<.78125 THEN NUM=3:DEN=4:RETURN
330 IF FR>=.78125 AND FR<.84375 THEN NUM=13:DEN=16:RETURN
340 IF FR>=.84375 AND FR<.90625 THEN NUM=7:DEN=8:RETURN
350 IF FR>=.90625 AND FR<.96875 THEN NUM=15:DEN=16:RETURN
360 IF FR>=.96875 THEN NUM=0:DEN=0:INCH=INCH+1:RETURN
370 PRINT:PRINT:RETURN

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LONG-TIME ATCO MEMBER DAVE, W8AER, ENJOYING OUR SPECIAL EVENT.

## LOW NOISE GasFet SUPPLIER

The need for replacing a low noise GasFet in a preamplifier seems to happen more often than one might think. A source for the popular Mitsubishi 1302 and 1402 has been found. Write to Norman Alred, WABEUU, or call after 6:00 p.m.

Mailing address is Microwave Components of Michigan, 17141 Maryman Avenue, Romulus, Michigan 48174. The phone number is 313-753-4581.

Price of the GasFet is determined by the noise figure, the upper frequency limit, and gain requirements. A typical cost is between seven and fifteen dollars. Dick, W8RVH, has used this supplier. (Submitted by Bill, W8DMR.)

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PI=3.14159265358.....

Much interest in the circle has centered around the true value of pi; and for thousands of years mathematicians and others attempted to find its absolute value. This problem of finding the actual value of pi is referred to as the problem of "squaring the circle." It was not until the year 1786 that pi was definitely proven to have no exact value; therefore, it is impossible to "square the circle."

To calculate the "approximate" value of pi, the following simple Basic computer program can be written into most computers (remember the angle of measurement here is in radians):

```
10 CLS: REM THIS CLEARS SCREEN
20 REM: PI = 16 arctan 1/5 - 4 arctan 1/239
25 PI=16*ATN(1/5) - 4*ATN(1/239)
30 PRINT PI
```

Running this program will yield a figure of 3.141593; however, this is a "rounded" answer due to the limitations of the normal PCs. By using the ENIAC COMPUTER at the Ballistic Research Laboratories at Aberdeen Proving Ground, Maryland, pi was computed by using the above formula to 2040 places. If you would like a copy of the entire 2040 place printout of the pi value generated by the ENIAC COMPUTER, please contact Bob, W8TV.

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ATQO CHANGES PUBLICATION DATE - W8DMR reports Volume 2, Number 3 of ATQO arrived about six weeks late but was another great issue. A notice was received that henceforth publication will occur approximately 30 days after the beginning of each calendar quarter.

## ATCO FINANCIAL STATEMENT

CASH BALANCE:  
As of 30 June 1989.....\$475.08

RECEIPTS:  
Dues.....\$ 60.00

EXPENDITURES:  
Printing charges for July 1989 ATCO Newsletter.....\$ 54.13  
Postage for July 1989 ATCO Newsletter..... 18.00  
Printing charges for ATCO Show 'n Tell Newsletter.... 5.71  
Postage for ATCO Show 'n Tell Newsletter..... 14.00  
Misc. costs incidental to publication of newsletter.. 32.88  
Food and incidentals for Show 'n Tell Event 24 Sep... 123.33  
Total expenditures.....\$248.05

SUMMARY:  
Cash Balance as of 30 June 1989.....\$475.08  
Receipts..... 60.00  
Expenditures.....-248.05  
Balance as of 30 September 1989.....\$287.03

The above financial report was prepared as of 30 September 1989 by Warren G. Duemmel, K8BGZQ, Acting ATCO Treasurer.

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### NEW ATCO MEMBERS

We welcome Rick, WA3DTO; Ray, N8FC; Patty, N8LEP; and Bill, W8BYIF.

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### HISTORY OF ATV PUBLICATIONS

(continued from page 4)

cations will suffer. Even local newsletters are experiencing the effect of the presence of such publications with color photos and glossy covers. Regardless, all ATVers wish the publishers the best of luck.

The research for this brief history of ATV publication concerned only monthly magazines. Research excluded ATV texts or books and also excluded foreign publications. (Submitted by Bill, W8DMR.)





## ATCO MEMBERS AS OF 30 SEP 1989

KBAEH	Wilbur Wollerman...	1672	Rosehill Rd.....	Reynoldsburg	43068
WBAER	David Sears.....	1678	Kaiser Dr.....	Reynoldsburg	43068
K8AOH	Charles Tucker.....	1500	E. Leffel Lane.....	Springfield	45505
KB2ARL	Dave DiGiuseppe.....	5685	B Hibernia Dr.....	Columbus	43232
WABATF	Emmett McDonald...	14120	Flintridge Rd. SE...	Glenford	43739
W9AZO	Jim Walter.....	2662	St.Rt. 39 NW RD#3...	Mansfield	44903
W88BW	Joe Schumann.....	5418	Marietta Rd.....	Chillicothe	45601
KB8BIY	Bob Shaw.....	59	Parkview Ave.....	Westerville	43081
W8BJN	Gene Kirby.....	13613	U.S. 36.....	Marysville	43040
W8BLN	Bob Pfeiffer.....	135	South Main St.....	North Hampton	45349
W8CCW	John Ferrell.....	3722	Wagner Court.....	Grove City	43123
N8CYV	Blaire Standley.....	721	West North St.....	Springfield	45504
KN8DMK	Bill Delker.....	8460	Bowers Rd.....	Amanda	43102
W8DMR	William Parker.....	2738	Floribunda Dr.....	Columbus	43209
WA3DIO	Rick White.....	5314	Grosbeak Glen.....	Orient	43146
N8DUK	Ron Reynolds.....	4642	Glengate Dr.....	Columbus	43232
W8EHW	Foster Warren.....	124	East Clark St.....	North Hampton	45349
W8BELK	Bill Brown.....	12536	T.R. 77.....	Findlay	45840
WABEOY	John Schlaechter...	3199	Lewis Rd.....	Columbus	43207
KB8ESR	Tommy Camm.....	1267	Arkwood Ave.....	Columbus	43227
N8FC	Ray Jepsen.....	1070	Wiltshire Rd.....	Columbus	43204
N8FFO	Edward Hauff.....	2716	Columbus Ave.....	Columbus	43209
KABGZO	Warren Duemmel.....	3488	Darbyshire Dr.....	Hilliard	43026
KBHRR	Ira Bickham.....	260	Tiki Dr.....	Merritt Is., FL	32953
KBHVA	Guy Cunningham, Jr...	31	Birchfield St.....	Plymouth	44865
WG8I	Chris Vojsak.....	2050	Ellington Rd.....	Columbus	43221
KBISM	Steve Iacono.....	1075	Virginia Ave.....	Columbus	43212
K8JGY	Fred Yost.....	330	Dellfield Way.....	Gahanna	43230
WABKQO	Dale Waymire.....	225	Riffle Ave.....	Greenville	45331
N8LEP	Patricia Parker.....	2738	Floribunda Drive...	Columbus	43209
W8BLGA	Charles Beener.....	2548	SR 61.....	Marengo	43334
W880BT	Tom Camm.....	1267	Arkwood Ave.....	Columbus	43227
W880TH	Perry Yantis.....	1850	Lisle Ave.....	Obetz	43207
WM8P	Bob Mills.....	6834	Halligan Ave. East..	Worthington	43085
KE8PN	James Easley.....	1507	Michigan Ave.....	Columbus	43201
K8PYQ	Lowell Brown.....	16149	Twp. Rd. 217.....	Mt. Victory	43340
W8RMC	Arthur Towslee.....	180	Fairdale Ave.....	Westerville	43081
W8RUT	Ken Morris.....	3181	Gerbert Rd.....	Columbus	43224
W8RVH	Richard Goode.....	9391	Ballentine Rd.....	New Carlisle	45344
W8RZG	Corwin Miller.....	4966	Haughn Rd.....	Grove City	43123
W8TTE	Phil Morrison.....	154	Llewellyn Ave.....	Westerville	43081
W8TV	Bob Dye.....	6118	Sedgwick Rd.....	Columbus	43235
W8UGV	Bruce Jaquish.....	4817	W. Arlington Park...	Fort Wayne, IN	46835
W8BURI	William Heiden.....	4435	Kaufman Rd.....	Plain City	43064
W8VSY	Jack Schmermund.....	401	North Main St.....	West Milton	45383
K8WEX	Phil Hardman.....	940	Oakwood Ave.....	Columbus	43206
K8YAH	Ronald Vanke.....	5094	Longrifle Rd.....	Westerville	43081
W88YIF	William White.....		Rt. 2, Box 344.....	Little Hocking	45742
K8BZPF	Johnny Camm.....	1267	Arkwood Ave.....	Columbus	43227

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## FIVE FIRMS TO RECEIVE HDTV MONEY

The Defense Advanced Research Projects Agency (DARPA) has named the first of the companies that will be receiving money for development work on high-definition television (HDTV). Contracts were awarded as part of a three-year, \$30 million HDTV program announced by DARPA earlier this year. The awarding of contracts to the five companies marks the first outlay of government money to support research work into HDTV.

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Editor: Warren, KA8GZQ  
Technical Editor: Bill, W8DMR

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FIRST CLASS MAIL

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ATCO NEWSLETTER  
c/o Warren G. Duemmel  
3488 Darbyshire Drive  
Hilliard, Ohio 43026

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ATCO NEWSLETTER

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1989

SHOW 'N TELL  
SOUVENIR ISSUE

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